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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/567,657

10/26/2006

Shigeru Nishio

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EDWARDS ANGELL PALMER & DODGE LLP

P.O. BOX 55874

BOSTON, MA 02205

EXAMINER

LEGESSE, HENOK D

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/567,657	Applicant(s) NISHIO ET AL.	
	Examiner HENOK LEGESSE	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim 1, drawn to an electrostatic suction type fluid discharge device, with pre-charge voltage provided immediately before a rise of the pulse voltage, pre-charge voltage having same polarity as the upper limit voltage, with absolute value of the pre-charge voltage being smaller than the minimum voltage of induced discharge.

Group II, claim(s) 2,7, drawn to an electrostatic suction type fluid discharge device with attenuation facilitating voltage provided immediately after a fall of the pulse voltage, with the attenuation facilitating voltage having an opposite polarity to that of the upper limit voltage.

Group III, claim(s) 3,7, drawn to an electrostatic suction type fluid discharge device the pre-charge voltage having an opposite polarity to that of the upper limit voltage.

Group IV, claim 4, drawn to an electrostatic suction type fluid discharge device with attenuation facilitating voltage having same polarity to that of the upper limit voltage, with absolute value of the pre-charge voltage being smaller than the pre-charge voltage.

Group V, claim 5, drawn to an electrostatic suction type fluid discharge device with a pre-charge voltage is provided immediately before starting application of the DC voltage, the pre-charge voltage having a same polarity as that of the DC voltage, an absolute value of the DC voltage being set smaller than the minimum voltage to induce discharge.

Group VI, claim(s) 6,7, drawn to an electrostatic suction type fluid discharge device with an attenuation facilitating voltage provided immediately after an end of

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application of the DC voltage, the attenuation facilitating voltage having an opposite polarity to that of the DC voltage.

Group VII, claim 8, drawn to an electrostatic suction type fluid discharge method with fluid discharge hole having a diameter ranging from $1\mu\text{m}$ to $5\mu\text{m}$, a pre-charge voltage provided immediately before a rise of the voltage, the pre-charge voltage having a same polarity as that of the voltage, an absolute value of the voltage being set smaller than the minimum voltage to induce discharge.

Group VIII, claim 9, drawn to an electrostatic suction type fluid discharge method with the voltage being equal to or greater than a minimum voltage to induce discharge, an attenuation facilitating voltage is provided immediately after a fall of the voltage, the attenuation facilitating voltage having an opposite polarity to that of the voltage.

Group IX, claim(s) 10,12, drawn to an electrostatic suction type fluid discharge device with line-drawing means controlling a speed of the relative movement, in accordance with a period of intermittent discharge which is performed at a frequency depending on the voltage and an electric conductivity of the fluid.

Group X, claim(s) 11,12, drawn to an electrostatic suction type fluid discharge device with line-drawing means controlling the voltage, the discharge pattern being discharged intermittently, and being determined depending on a speed of the relative movement.

Group XI, claim 13, drawn to an electrostatic suction type fluid discharge device with line-drawing means carrying out line drawing with a scanning speed and a voltage specified as: $V_{in} > 31v + 75$ where v is scanning speed, and V_{in} is the voltage, provided that an electric conductivity of the fluid is in a range of $10^{-7} - 10^{-9}\text{S/cm}$.

Group XII, claim 14, drawn to an electrostatic suction type fluid discharge method with step to carry out line-drawing, the voltage being equal to or greater than a minimum voltage to induce discharge, controls speed of the relative movement to discharge pattern partly overlaid in accordance with a period of intermittent discharge at a frequency depending on the voltage and an electric conductivity of the fluid.

Group XIII, claim 15, drawn to an electrostatic suction type fluid discharge method with step to carry out line-drawing, the voltage being equal to or greater than a

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minimum voltage to induce discharge, controls speed of the relative movement to discharge pattern partly overlaid discharged intermittently, and being determined depending on a speed of the relative movement.

Group XIV, claim 16, drawn to an electrostatic suction type fluid discharge device with nozzle diameter range between 1 to 5 μm , with a voltage value = V_o , and an application time = t , $130V < V_o [1 - \exp(-t/RC)]$ where R is resistance of the fluid, C is capacitance between the fluid in a tip of the nozzle and the discharge target.

Group XV, claim 17, drawn to an electrostatic suction type fluid discharge device with nozzle diameter range between 1 to 5 μm , with a voltage value = V_o , and an application time = t , $130V < V_o [1 - \exp(-t/RC)] < 250$ where R is resistance of the fluid, C is capacitance between the fluid in a tip of the nozzle and the discharge target.

Group XVI, claim 18, drawn to an electrostatic suction type fluid discharge device with nozzle diameter range between 1 to 5 μm , with a voltage value = V_o , and an application time = t , $130V < V_o [1 - \exp(-t/RC)] < 250$, $V_o < 250$ where R is resistance of the fluid, C is capacitance between the fluid in a tip of the nozzle and the discharge target.

Group XVII, claim 19, drawn to an electrostatic suction type fluid discharge device with nozzle diameter range between 1 to 5 μm , with the device satisfy $V_H = -0.001X^2 + 0.44X + 125$ $V_L = -0.0013X^2 + 0.69X + 160$ where X is distance between the nozzle and the discharge target, and V_H and V_L express maximum and minimum values of discharge start voltage.

Group XVIII, claim 20, drawn to an electrostatic suction type fluid discharge method with nozzle diameter range between 1 to 5 μm , with a voltage value = V_o , and an application time = t , $130V < V_o [1 - \exp(-t/RC)]$ where R is resistance of the fluid, C is capacitance between the fluid in a tip of the nozzle and the discharge target.

2. The inventions listed as Groups I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV, XVI, XVII, and XVIII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special

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technical features for the following reasons: The groups listed above are not within the permitted combination of different categories of inventions. That is the twelve apparatuses and five method groups. As set forth in PCT/JP04/11376, there is no special technical feature that defines a contribution over the prior art, JP 10-52917A, JP 63-7946 A, and JP 7-223317 A define common technical features.

3. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

- A. The embodiment of Fig.9 (electrostatic suction type fluid discharge device according to Fig.9).
- B. The embodiment of Fig.18 (electrostatic suction type fluid discharge device according to Fig.18).
- C. The embodiment of Fig.25 (electrostatic suction type fluid discharge device according to Fig.25).

4. Upon election of Group A ,B, or C the applicant is further required to elect one of the following disclosed species. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

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- i. The embodiment of Figs.1a,1b (pulse voltage according to Figs. 1a,1b).
- ii. The embodiment of Figs.10a,10b (pulse voltage according to Figs. 10a,10b).
- iii. The embodiment of Figs.12a,12b (pulse voltage according to Figs. 12a,12b).
- iv. The embodiment of Fig.14 (pulse voltage according to Fig. 14).
- v. The embodiment of Figs.15a,15b (pulse voltage according to Figs. 15a,15b).
- vi. The embodiment of Figs.16a,16b (pulse voltage according to Figs. 16a,16b).

Applicant is required, in reply to this action, to elect a single species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

5. The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: As set forth in PCT/GB03/05626, there is no special technical feature that defines a contribution over the prior art.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HENOK LEGESSE whose telephone number is

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(571)270-1615. The examiner can normally be reached on Mon.- Fri. Between. 8:00 AM-6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MATTHEW LUU can be reached on (571)272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW LUU/
Supervisory Patent Examiner, Art Unit 2861

H.L.
March 8, 2010